

REMARKS / ARGUMENTS

Introduction

The present Amendment is in response to the Examiner's Office Action mailed September 12, 2006. Claims 1, 7, 9, 16, 25, and 39 have been amended. Claims 1-7 and 9-39 remain pending in view of the above amendments.

The Applicant expresses appreciation to the Examiner for the withdrawal of the objections to claim 20 and to the Drawings, and for the withdrawal of the 35 USC 112 second paragraph rejection of claim 10. The Applicant also expresses appreciation for the consideration of the IDS filed 2/17/06.

Please note that the following remarks are not intended to be an exhaustive enumeration of the distinctions between any cited references and the claimed invention. Rather, the distinctions identified and discussed below are presented solely by way of example to illustrate some of the differences between the claimed invention and the cited references. Reconsideration of the application is respectfully requested. For the Examiner's convenience and reference, Applicant's remarks are presented in the order in which the corresponding issues were raised in the Office Action.

Rejections Under 35 U.S.C. § 103

The Examiner rejected claims 1-7, 9-22, and 28-39 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,432,922 (*Polyzois*) in view of WO 95/00906 (*Rollins*) and further in view of U.S. Patent No. 6,047,356 (*Anderson*). Applicant respectfully disagrees and, for at least the following reasons, illustrates that the cited art fails to establish a *prima facie* case of obviousness.

Elements of Claims are not Taught in *Rollins*, *Major*, and *Anderson*

In order to establish a *prima facie* case of obviousness, the prior art references must teach or suggest all the claim limitations. In the present case, all of the claim limitations are not taught or suggested by the cited art.

For example, the Examiner cites to col. 4, line 58-col. 5, line 9 of *Polyzois* as teaching the requirement of "determining that the first server has write access to both the first mass storage device and to a second mass storage device by performing a policing protocol in response to the write request." In fact, the portion of *Polyzois* cited

by the Examiner is describing Figure 2, which describes a region of non-volatile memory, as well as pointers within the non-volatile memory indicating the order in which memory blocks should be written on the disk. See *Polyzois* col. 4, lines 55, 63-68.

Conversely, claim 1 requires that a determination be made as to whether the first server has write access to the first and second mass storage devices "by performing a policing protocol." As described on page 6, lines 19-20 of the Specification, a policing protocol is employed to "specify that only one server at a time can execute write requests on particular portions of the network data." Because *Polyzois* does not teach or suggest the use of multiple servers for performing mirroring of data, *Polyzois* does not teach or suggest "performing a policing protocol" to "determine[e] that the first server has write access to both the first mass storage device and to a second mass storage device."

The Examiner next states that *Rollins* remedies the failure of *Polyzois* to teach "using a mirror engine of the first server, transmitting a copy of the write request to the second server". The Examiner supports this assertion by citing to page 15, lines 4-17 and page 23, line 13 – page 24, line 12 of *Rollins*. Applicants respectfully disagree.

As stated in the Abstract, *Rollins* is directed to the transferring of disk storage from a failing server to a non-failing server to make the disk storage contents identical following the failure of a server processor 111 or 121. Specifically, when the failure of server 120 is detected, an "SFT-III running on server computer system 111" (See page 21, line 12) will remember all data not mirrored on server 121 during the failure (See page 22, line 8-9). A connection means 241 is provided for controlling the connections between the mass of storage systems 113 and 122 to the computers 111 and 121. See page 15, lines 4-17. Prior to restoring the mass storage system 122, the connection means 241 disconnects a direct link between the computer 121 and the mass storage system 122 and creates a direct connection between the mass storage system 122 and the computer 111. See page 22, line 19 – page 23, line 2. In order to restore the mass storage system 122, the SFT-III copies its "remembered" information from the computer 111 to the mass storage system 122 using the direct connection described above. See page 24, lines 1-5.

But using the direct connection to copy data to the mass storage system 122 following a server failure, *Rollins* teaches away from claim 1, which "transmit[s] a copy of the write request from the first server to a second mirror engine of the second server", which then executes the copy of the write request. FAs a result, the requirements of claim 1 such as "determining that the first server has write access to both the first mass storage device and to a second mass storage device by performing a policing protocol in response to the write request" cannot be performed because the server in *Rollins* has failed.

In addition, even in normal operation, *Rollins* fails to teach or suggest "determining that the first server has write access to both the first mass storage device and to a second mass storage device by performing a policing protocol in response to the write request" because *Rollins* teaches that "both server computer system 110 and server computer system 120 handle each mass storage write request received from network 101". See page 6, lines 1-8. Furthermore, the previous Office Action mailed 1/17/06 (Paper No./Mail Date 010906), acknowledged that "*Rollins* failed to teach, using a mirror engine of the first server, transmitting a copy of the right request [to] the second server."

The Examiner then acknowledges that both *Polyzois* and *Rollins* fail to teach executing the copy of the write request at the second server . . . without processing the write request using an I/O driver of the second server" The Examiner cites *Anderson* to remedy the deficiencies of *Rollins* and *Major*. Applicants respectfully disagree.

Anderson fails to teach or suggest "executing the copy of the write request at the second server by the second mirror engine . . . without using an I/O driver of the second server", as is required by claim 1. The portions of *Anderson* cited by the Examiner discuss a client handler task that maintains a "client cache" in RAM for each open file. See col. 7, lines 26-27. *Anderson* does not disclose that the same data is written to two separate mass storage devices. Instead, the "write requests" discussed by *Anderson* are sent by a client to a single server, which completes the write. See col 9, lines 15-17.

The Applicant reiterates that *Anderson* does not teach or suggest the ability to perform data mirroring. Consequently, *Anderson* also lacks the requirement of claim 1 that the write request is executed "by the *mirror engine*." Likewise, *Anderson* fails to teach that "the data is stored in a virtual shared storage node from the standpoint of the first server and the second server", because the data on a first mass storage device has not been mirrored on a second mass storage device. Therefore, the *Anderson* reference does not include a virtual shared storage node.

The Examiner also suggests that *Anderson* teaches "without processing the write request using an I/O driver of the second server". Applicant disagrees and notes that *Anderson* suggests both "partitioning mass storage device cache and I/O buffer memory into a plurality of memory units of equal size" and that a "plurality of sets of the units are dynamically assigned to mass storage device caches and I/O device buffers". See col. 2 lines 37-41. These teachings suggest, contrary to the Examiner's assertion, that *Anderson* in fact contemplates using I/O drivers if the I/O device buffers are dynamically assigned. Thus, the assertion of the Examiner that *Anderson* teaches "without processing the write request using an I/O driver of the second server" is traversed.

As the Examiner is aware, in order to rely on reference as prior art, the reference must be analogous prior art. MPEP 2141.01(a). In order to qualify as analogous prior art, the reference must either be in the field of the applicant's endeavor or be reasonably pertinent to the particular problem with which the inventor was concerned. *Id.* As also stated in MPEP 2141.01(a), "the similarities and differences in structure and function of the inventions . . . carry far greater weight than the Patent Office's classification of the references. Because *Anderson* is non-analogous prior art, the Office Action improperly relies on it as a reference.

Anderson is directed to a distributed file system with dedicated nodes capable of being connected to workstations at their bus. See Abstract. *Anderson* does not teach or suggest the Applicant's field of endeavor, i.e., the ability to mirror data between two or more mass storage devices. Furthermore, *Anderson* is not reasonably pertinent to the particular problem with which the Applicant is concerned. Instead, the system of *Anderson* uses a complementary client-side and server-side file caching method to increase parallelism by issuing multiple server requests to keep the hardware devices

busy simultaneously. See abstract. The *Anderson* reference attempts to solve this problem by managing the buffer pool within cache blocks in RAM to ensure that allocation requests will succeed. See col. 5, lines 17-20. Because the *Anderson* reference is not in the Applicant's field of endeavor, and because *Anderson* is not reasonably pertinent to the mirroring of data, *Anderson* cannot be relied on as a reference because it is non-analogous art.

For at least these reasons, claim 1 overcomes the cited art and is in condition for allowance. The other independent claims 9, 16, 20, and 28 also overcome the cited art for at least the same reasons. The dependent claims 2-7, 10-15, 17-19, 21-22, and 29-39 also overcome the cited art for at least these reasons.

Claims 22-27, which were rejected under *Polyzois*, *Rollins*, and *Anderson* in view of U.S. Patent No. 5,276,867 (*Kenley*) depend from claim 20 which overcomes the art for at least the reasons indicated above. Because *Polyzois*, *Rollins*, and *Anderson* do not teach "using a mirror engine of the first server, transmitting a copy of the write request from the first server to a second mirror engine of the second server" or "executing the copy of the write request at the second server by the second mirror engine of the second server to write the data to the second mass storage device . . .", and *Kenley* does not fulfill this deficiency, claims 22-27 also overcome the cited art and are in condition for allowance for at least these reasons.

Conclusion

In view of the foregoing, Applicants respectfully submit that claims 1-7 and 8-39 are in condition for allowance. In the event that the Examiner finds remaining impediments to a prompt allowance of this application that may be clarified through a telephone interview, the Examiner is requested to contact the undersigned attorney.

Dated this 12th day of December, 2006.

Respectfully submitted,

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